

ED 306 876

HE 022 600

TITLE Key Success Factors for an Undergraduate Computer Information Systems Program.

INSTITUTION American Association of State Colleges and Universities, Washington, D.C.; Wisconsin Univ., Whitewater.

PUB DATE Mar 89

NOTE 15p.; This report is one of a group gathered by the AASCU/ERIC Model Programs Inventory Project, funded by the Fund for the Improvement of Postsecondary Education to the American Association of State Colleges and Universities, in collaboration with the ERIC Clearinghouse on Higher Education. For related documents, see HE 022 565-617, HE 022 619-643 and HE 022 645-659.

PUB TYPE Reports - Descriptive (141)

EDRS PRICE MF01/PC01 Plus Postage.

DESCRIPTORS *Business Administration; Business Administration Education; College Curriculum; *College Programs; *Computer Science; Faculty Development; Higher Education; *Information Systems; Intercollegiate Cooperation; Internship Programs; Models; Program Descriptions; Relevance (Education); *School Business Relationship; State Universities; Success

IDENTIFIERS *AASCU ERIC Model Programs Inventory Project; *University of Wisconsin Whitewater

ABSTRACT

The Management Computer Systems major at the University of Wisconsin-Whitewater, which is described in this report, is an integrated, intercollegiate undergraduate program designed to provide graduates with both general business skills and the technical computer skills required to bridge the technical-management gap widely reported in industry. Three of the important factors in the success of this program have been: (1) providing the necessary expertise for this venture by staffing the program with both computer science and management faculty; (2) establishing a number of joint academic-industry cooperative projects designed to keep the program viable and current, including an industrial advisory board and student and faculty internships; and (3) revising the curriculum every 3 to 5 years. A brochure for the program is appended. (KM)

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ED306876

Title: KEY SUCCESS FACTORS FOR AN UNDERGRADUATE
COMPUTER INFORMATION SYSTEMS PROGRAM

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AASCU/ERIC Model Programs Inventory Project

The AASCU/ERIC Model Programs Inventory is a two-year project seeking to establish and test a model system for collecting and disseminating information on model programs at AASCU-member institutions--375 of the public four-year colleges and universities in the United States.

The four objectives of the project are:

- o To increase the information on model programs available to all institutions through the ERIC system
- o To encourage the use of the ERIC system by AASCU institutions
- o To improve AASCU's ability to know about, and share information on, activities at member institutions, and
- o To test a model for collaboration with ERIC that other national organizations might adopt.

The AASCU/ERIC Model Programs Inventory Project is funded with a grant from the Fund for the Improvement of Postsecondary Education to the American Association of State Colleges and Universities, in collaboration with the ERIC Clearinghouse on Higher Education at The George Washington University.

(2) Abstract:

The Management Computer Systems major at the University of Wisconsin-Whitewater is a truly integrated, inter-collegiate undergraduate program designed to provide graduates with both general business and the technical computer skills required to bridge the technical-management gap widely reported in industry. Three key factors to the success of this program have been (1) providing the necessary expertise for this venture by staffing the program with both computer science and management faculty, (2) establishing a number of joint academic-industry cooperative projects designed to keep the program viable and current, including an industrial advisory board and student and faculty internships, and (3) revising the curriculum every 3-5 years.

(3) Introduction:

Since the inception of business computing in the late 1950's, there has always been a shortage of industrial computing professionals. All indications are that this shortage will continue into the next century and perhaps even intensify. The U.S. Bureau of Labor Statistics predicts that the categories of computer programmer and computer systems analyst will be two of the three fastest growing occupations in the country from 1984 to 1995 with need increasing by 71.7% and 68.7% respectively (Computerworld, November 25, 1985). The February, 1986 edition of DPMA's, Your Computing Career, reported a Fox-Morris projection that national demand for the same two job categories would increase by 10% a year for the next few years.

Coupled with this steady growth in demand has been a perplexing sharp downturn of well over 50% in enrollment across the country in academic computing programs. The most telling statistic comes from the annual UCLA study of entering college freshmen. In 1982, 8.8% of the nation's freshmen were planning to pursue a computing major - an all time high. By the fall of 1988, the percentage had fallen to 2.7% which was at the 1977 level.

Perhaps the situation is best summed up in the beginning of a September 15, 1988 Datamation article entitled, "How College Students Choose IS Careers":

IS journals and business publications these days are filled with warnings on the intensifying labor shortage within the computer field. The labor demand is great; one prediction says the need for systems analysts will increase by 76% between now and the year 2000. A recent survey of 100 major corporations reports that four of the five fastest growing occupations between now and 1995 will involve computers.

Despite the opportunities, article after article reports that the supply of systems analysts, systems programmers, network planners, and software engineers is short and will get shorter through the end of the century.

As a result of this threatened severe shortage of a critical element in the nation's manpower supply, many colleges and universities may be planning to initiate or revitalize a business related computer degree program. However, to create and maintain a quality offering in this area is not a trivial task and requires extensive resources of time, people, equipment and commitment. Indeed, there are a number of key success factors involved that are not prevalent in other academic areas. Although these factors may be vital to the creation of a viable program, they may not be recognized as critical by administrators or even by those involved in the project until too late.

It is the purpose of this report to identify three of these critical success factors and then describe how the Management Computer Systems program at the University of Wisconsin-Whitewater has approached the challenges associated with each of these factors.

(4) Background:

Many industry representatives have consistently criticized educational institutions for not adequately meeting the need of organizations for graduates who are both technically qualified in computing skills, procedures and techniques and who also have an understanding of the managerial needs of the functional areas of the enterprise. Many computer system implementation failures can be traced to the lack of communication between management and computer personnel.

A common complaint heard in the 1970's was that business managers were being educated with no knowledge of computing and information systems, and computer science graduates were unfamiliar with business processes and procedures. What was needed was a curriculum that could bridge this gap and link the two fields more directly. In particular, college graduates were required who could both function effectively in a general business setting, understanding the accompanying problems, as well as the associated managerial and organizational behavior concepts and could also have the technical computing skills to design and implement information systems to solve those problems. However, many business people felt that colleges and universities were unresponsive to these needs.

During 1982, in recognition of this demand, the two largest professional computing societies, ACM (Association for Computing Machinery) and DPMA (Data Processing Management Association) published separate model curricula designed to deal with this problem. DPMA has since updated its curriculum in 1986 and the ACM curriculum is currently being revised. This new area, which is essentially the synthesis of computer science and management information systems, is rapidly becoming known as computer information systems (CIS). However, the creation and maintenance of a strong, viable CIS program is a non-trivial task. A number of special challenges lay in wait to snare the unwary. There are several key success factors that, in aggregate, seem to be unique to business related computing programs.

Among these key success factors are

- (i) Creating a program which has an appropriate blend of faculty.
In a true CIS program which deals in depth with both technical computing and managerial business topics, the wide diversity of expertise in computer science, mathematics, systems analysis and design, microcomputing, networks/communications, computer center management, business management and other related areas required to maintain professional standards in the wide variety of courses offered is not usually found in any one discipline, department or possibly even in one college. Yet, if the computing coursework is divided between two separate departments or even colleges, there is inevitable duplication of material or important topics missed altogether. Furthermore, unless there is some administrative coordination of the offerings, the courses are not properly sequenced and tend to be isolated entities that do not build upon one another. A single administrative structure that unites these diverse faculty interests into a common goal is advised.
- (ii) Creating a curriculum which meets the real, expressed needs of industry. This really means investing the time and energy to maintain contacts with regional industry representatives to determine what those needs and requirements are. If this is truly accomplished, then curricula will vary by region, by exact location within region and by school type. Such diversity is good for students who have a real choice, good for the educational institutions who can choose their market niche and strive for excellence in that particular aspect of computing, good for employers who can support and recruit from those programs who match their needs and good for the overall field.

This does not mean that potential industrial employers should dictate a program's course offerings. But their needs, wishes and desires should be factored into curricula designs.

- (iii) Keeping the curriculum up-to-date and viable. Obsolescence is always a lurking spectre in the computing field. The emergence of new technologies, applications and methodologies continuously challenges the viability of all academic computing programs. It is generally acknowledged that the half life of computing knowledge is somewhat less than three years. As the actual subject matter of the field changes, so to do the potential professional career paths and the skill sets required to be successful in these new or revised careers.

Thus, it is an obligation of a CIS program to stay abreast of these changes and undergo major curriculum revisions every 3-5 years. Indeed, it can be argued that the rate of change in the computer field is so rapid that no computing course should ever be taught in exactly the same way twice. Thus, the specific courses are undergoing constant minor revisions, but periodically the curriculum as a whole needs to be reviewed, reshuffled, added to and deleted from to accommodate new and revised goals and directions. There is a strong linkage between this point and the previous one.

(5) Program Description:

The Management Computer Systems (MCS) program is an undergraduate computer information systems major established at the University of Wisconsin-Whitewater in 1978. Now entering its second decade, the program has achieved a level of national recognition and stature and its graduates have earned the reputation of being among the most well prepared and successful in the county.

The strong points of the program have included the manner in which the three challenges listed in the preceding section have been met. The exact solutions or at least the MCS approach to the solutions would be of interest to and replicable at other post-secondary institutions seeking to create or revitalize a similar computing degree program.

How has MCS dealt with these three key issues?

(i) Creating an appropriate blend of faculty.

The MCS program is a truly integrated, intercollegiate, interdisciplinary program sponsored by the Management Department in the College of Business and Economics and the Mathematics/Computer Science Department in the College of Letters and Sciences. Both departments provide the program with faculty who teach both MCS courses and offerings from their home departments. The program is administered by a half-time coordinator who serves as a department chair and reports to the Deans of both colleges. The program enjoys its own budget lines, administrative offices and secretarial staff. Thus, the program acts like a department in every respect except for personnel matters.

This structure enables the best computing talents on campus to be blended into a comprehensive whole which contains the diverse expertise required for a true CIS program. Faculty from the two colleges apply their particular knowledge to those portions of a unified, structured curriculum that most interest them and yet feel comfortable with personnel matters being handled by their peers in their home departments. Another advantage of this structure is the continuous cross fertilization of ideas between what are usually two separate and isolated academic departments in different colleges. There are currently eleven faculty attached to the program; four from Management and seven from Mathematics/Computer Science.

Because of this intercollegiate arrangement MCS majors may earn either a Bachelor of Business Administration or a Bachelor of Science Degree.

(ii) Meeting industry needs.

The MCS major was developed with the aid of industry representatives and in direct response to their expressed need for highly qualified business computing specialists. Since its inception, the primary objective of the program has been to teach students to "effectively apply modern management concepts and computer techniques toward the design, development and implementation of computer-based information systems." The main purpose of the curriculum has always been to provide both general business and technical computing skills to enable graduates to bridge the gap between information systems and management. The emphasis is on pragmatic, functional problem solving in a commercial environment while providing a theoretical basis for further advanced study. Assignments are structured to reflect actual business practices and industrial standards are enforced. The philosophy is adopted that concepts are best understood when put to actual use.

This task is not easily accomplished. Close ties with industry have been fostered and maintained to provide the best possible education for the students. This business-academic partnership and dialogue is directly responsible for much of the program's success. Specific joint, cooperative efforts include:

- (a) MCS Executive Advisory Board currently consisting of twenty-two information systems specialists from the area's major industries. This board meets with the faculty semiannually and is charged with keeping the curriculum viable and up-to-date and with providing the program with proper goals and directions. All curriculum initiatives and revisions are strongly influenced by the recommendations and suggestions of these industrial representatives.
- (b) MCS Cooperative Studies Program enables a student to spend a seven month period, usually at the end of their junior year, in the information systems area of an approved company. The students are paid by their host company, receive academic credit and gain invaluable work experience before graduation. Many students are ultimately hired full time by their Co-op employer. Approximately one-half of the MCS graduates elect to participate in this program. One quarter release time is provided by the University to administer this program.
- (c) MCS Faculty Summer Internship Program places faculty in industrial information system settings for the summer. This enables faculty to bring back current industry practices and procedures into the classroom and provides exposure to problems, solutions, hardware, software and methodologies not always available at an academic institution. In addition, faculty salaries are incremented and such experiences often lead to further consulting work.
- (d) MCS Colloquium series features 4-6 presentations each semester by either a faculty member or a professional in the field dealing with various computing topics of interest.
- (e) Scholarship programs, particularly the MCS Minority Scholarship Program, provides a direct avenue of support from the sponsoring companies to the most talented students in the program.

- (f) Training programs. A few regional companies have made their internal educational/training programs available to the MCS faculty. Faculty attend these sessions to augment their existing skills and stay current in the field.
 - (g) The program also supports a student chapter of the Data Processing Management Association (DPMA). Among their activities is a banquet in the fall and a career day in the spring, both of which enable students and potential employers to interact on both a formal and an informal basis. In addition, the chapter features a monthly professional speaker and two field trips each semester. They publish a senior resume booklet and student user guides for university hardware and software. They also offer mini courses on specific popular software, sponsor campus visits for high school computing groups and engage in consulting work for local businesses.
- (iii) Keeping the curriculum up-to-date and viable.
- Since its inception in 1978, the MCS program has undergone three major curriculum revisions in order to stay current with the dynamics of this rapidly changing field. The latest revision was generated during 1985-86. Minor revisions in individual courses and topics occur continuously. Another major (and perhaps the most far reaching) revision is scheduled for 1989-1990.

It can be unsettling to change curricula so often. One just gets comfortable with a set of courses when they get uprooted and you begin again. It can certainly be difficult to administer a program that changes so often. However, we believe that this is in the best interests of the faculty, students and program and is the only way to insure that the student's skill sets upon graduation meet industry needs.

All curricular action is presented to the Executive Advisory Board for review, suggestion, comment and criticism. It generally takes about 12 months from the initial planning of a change to the actual offering of the first revised course.

(6) Results:

The program has been highly successful. Demand for its graduates has been strong as reflected in the program's placement rate which is annually in the 90-100% range. The overall placement percentage for the more than 500 graduates is about 95%. Also, since 1984 the average starting salaries for MCS graduates has been the highest of any degree program at the university. However, the most significant indicator of the program's success has come through the industry's professional society, the Data Processing Management Association.

In 1984, DPMA and its Education Foundation established their International Award Series. One of these awards, the Four Year Institution Award, is presented annually to the top-ranked computer information systems degree program in the United States and Canada at a four year institution. The ranking is done by an expert panel of industry professionals and educators and the criteria include curriculum quality, support for industry activities, service to information processing professionals, enrollment and placement achievements, faculty performance and quality and commitment to information processing education excellence.

MCS was chosen as the initial recipient of this award in 1984. In 1985, MCS was among the award's five semifinalists. In 1986, MCS became the first repeat winner in the International Series by reclaiming the Four Year Award. Also in 1986, DPMA instituted a new policy which excludes award winners from competition for two years. Thus, MCS will not be eligible for this honor again until 1989. Other award winners and semifinalists have included Purdue, Cal State Polytechnic Institute, Texas A & M, San Francisco State, New Mexico State and Virginia Commonwealth.

Partially as a result of this national recognition, the University constructed a new academic computing building, McGraw Hall, which serves as the new home of the MCS program. Completed in August, 1988, this \$4.5 million structure contains state of the art electronic tools and classrooms for teaching computing topics as well as six new student computing laboratories.

In September, 1988, the MCS program was designated by the Board of Regents to be a University of Wisconsin "Center of Excellence" for Computer Information Systems. To achieve this prestigious recognition, a program must be nationally recognized as among the best in its field and must make a substantial impact on the economic or cultural development of the state, region and nation. An extensive internal and external evaluation and review process was used to select the Centers. Less than 4% of the program throughout the University of Wisconsin System were so recognized.

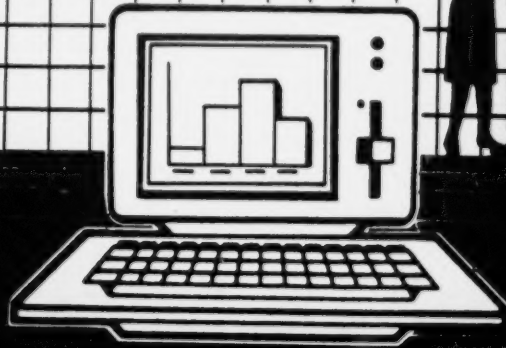
(7) Conclusions and Recommendations:

Because of the projected critical shortage of computing professionals, many institutions of higher education may be looking to start up or upgrade their computer information systems degree programs. There are a number of special problem areas associated with such an undertaking which may be overlooked or not considered to be particularly vital to the project. This report has identified three such areas as being key success factors for the Management Computer Systems program at the University of Wisconsin-Whitewater, namely

- (i) Creating an inter-disciplinary, inter-departmental and possibly even an inter-college structure for the program which will allow faculty with the diverse expertise needed for the required course offerings to work together on a unified, coherent degree program. Coursework must include technical computing topics as well as business management training.
- (ii) Creating formal procedures for keeping in close contact with regional industry to insure that real, expressed needs are being met. Such joint ventures as an advisory board, student and faculty internships, scholarship programs, student professional society chapters and joint colloquium/training programs are suggested.
- (iii) Plan on a major curriculum revision every 3-5 years. These revisions and maintaining the industry contacts mentioned in the previous point will require a significant amount of a program's time and energy. Faculty must be provided the time and expense resources necessary to accomplish these tasks, and promotion and merit guidelines must recognize such projects as significant scholarly activities.

UNIVERSITY OF WISCONSIN
WHITEWATER

INTERNATIONAL
AWARD WINNER



**MANAGEMENT
COMPUTER
SYSTEMS**

What is Management Computer Systems?

The computer has become vital to the life and growth of many organizations, from small businesses to industrial giants including government, agricultural, manufacturing, financial, medical, service and educational institutions.

The computer is the nervous system of these organizations, providing management with one of their most critical resources: timely and accurate data and information. This ranges from simple record keeping functions to projections of the future and support for strategic planning and decision activities.

The Management Computer Systems (MCS) major is an inter-disciplinary, undergraduate program that offers a unique blend of both computing and business courses to enable graduates to harness the technical world of computers to satisfy the increasingly sophisticated and complex information needs of industry.

Ranked Number One by DPMA

The Data Processing Management Association (DPMA) is the world's largest professional computing society serving the business management community. In 1984, this organization inaugurated a series of International Awards, one of which, the Four Year Institution Award, is to be given to the top ranked academic computer program at a four year school as determined by DPMA and its Education Foundation.

The initial, 1984, winner of this international competition was the MCS program at UW-Whitewater. MCS was among the top five semifinalists in 1985 and recaptured the award in 1986. Thus, twice in this three year period, industry computing specialists, through their professional society, have chosen the UW-Whitewater major as the premier program for preparing students for the world of commercial computing.

How Does MCS Differ from Other Computer Majors?

There are several distinct types of academic computing degree programs. Computer Science degrees offer either a theoretical study of computers, algorithms and programming, or are oriented toward engineering and hardware design. On the other hand, Management Information Systems (MIS) programs emphasize business management concepts rather than technical computing training.

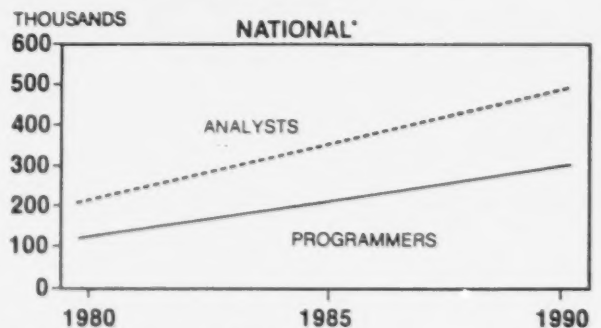
The MCS major combines the technical, programming skills of Computer Science with the information systems analysis and design concepts of MIS, producing graduates who can "bridge the gap" between management and information processing. This is a relatively new area of study that is rapidly becoming known as Computer Information Systems (CIS).

Career/Placement Opportunities

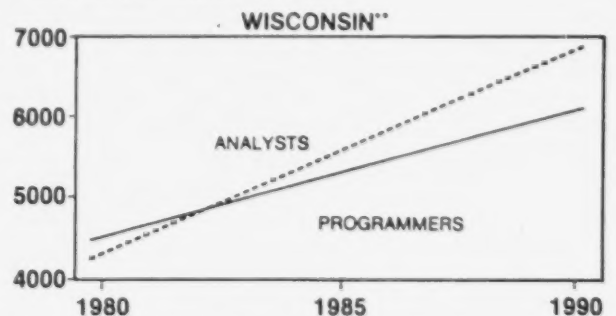
The MCS program prepares a student for a career as a computer systems analyst. A distinction must be made between a systems analyst and a programmer. This distinction is analogous to the difference between an engineer and a mechanic.

Beyond the skills needed to write the actual computer code, a systems analyst is also trained to generate the technical specifications and design of a computerized business system from a set of general user requirements.

Employment Projections



*Source: Datamation 9/83



**Source: State of Wisconsin

MCS Placement Rates/Average Starting Salaries

Year	Placement Rate	Average Salary
1983-84	92%	\$21,500
1984-85	95%	\$22,700
1985-86	94%	\$23,500

The University Placement Office assists all seniors in obtaining a professional position, as well as providing career counseling. Businesses, industries and service groups maintain an active contact with the UW-Placement Office for assistance in meeting their personnel needs.

Academic Program

Business or Liberal Arts?

Because of the inter-college structure of the MCS curriculum, students may earn either of the following degrees in MCS:

Bachelor of Business Administration (B.B.A.) degree
from the College of Business and Economics
or

Bachelor of Science (B.S.) degree
from the College of Letters and Sciences

The core MCS computing courses are precisely the same for both degrees. The only differences lie in the general requirements of the two individual colleges. The B.B.A. degree requires the common core business courses while the B.S. degree requires fewer business courses allowing the student to structure a program richer in liberal arts.

I. Common Requirements

University Proficiency and General Studies Requirements

University Proficiency Requirements, 11 credits or appropriate waivers: English 680101, 680102, Speech 666110, Mathematics 760141

General Studies Requirements*	31 cr. req. for B.B.A. 49 cr. req. for B.S.
The Arts	2-4 credits (B.B.A.) 2-5 credits (B.S.)
The Humanities	6-9 credits (B.B.A.) 9-12 credits (B.S.)
The Natural Sciences and Mathematics	8-10 credits (B.B.A.) 15-20 credits (B.S.)
The Social Sciences	6 credits (B.B.A.) 15 credits (B.S.)
Physical Education/Dance	1-2 credits (B.B.A., B.S.)
Ethnic Studies/Women's Studies	0-3 credits (B.B.A., B.S.)
Interdisciplinary Studies	0-6 credits (B.B.A., B.S.)

**MCS CORE CURRICULUM

- 765171, Introduction to Programming - Introduction to computing, structured logic and design using PASCAL.
- 950220, Concepts of Programming — Structured logic and design of commercial applications using PL/1.

- 950231 Concepts of Data Structures — In depth study of PL/1, data structures, and introductory data base concepts.
- 950232, Concepts of COBOL, with File Structures — Study of COBOL, direct and indexed files including online and maintenance programming.
- 950320, Concepts of Database Applications — Database theory and applications including CODASYL and relational databases.
- 950331, Systems Analysis and Design I — Initiation of a team project through the logical design phase.
- 950341, Hardware and Software Selection — Study of current hardware/software systems and evaluation criteria.
- 950431, Systems Analysis and Design II — Physical design and implementation of the team project begun in 950331.
- 950451, Topics in Computer Applications — Use of microcomputer and mainframe software packages, including spreadsheets, graphics, query languages, statistics, word processing, etc., to satisfy management information needs.

**Courses and course content subject to periodic revision.

Additional elective computing courses available include: 765271 Assembly Programming, 765302 Computer Logic and Microprocessors, 765307 Small Computer Applications, 765360 PASCAL Programming in Mathematics, 760365 Linear Programming, 250377 Data Processing Management, 950391 MCS Cooperative Studies, 765412 Computer Organization & Systems Programming, 765424 Operating Systems, 250471 Operations Research, 760471 Numeral Analysis, 250484 Simulation Modeling.

TYPICAL MCS COMPUTING PROGRAM 33 credits

Freshman Year

General Studies (Exceptionally well qualified students may begin their computing studies.)

Sophomore Year

765171, 950220

Junior Year

950231, 950232, 950320, 950331

Senior Year

950341, 950431, 950451

In addition, Management Concepts (250310) and 1 computing elective from a prescribed list are required.

Students pursuing an MCS degree from either college must achieve and maintain a 2.50 GPA or better in order to take MCS or business courses. Grades received for all appropriate college courses taken at other institutions will be included in determining the student's grade point average eligibility for enrolling in MCS and business courses.

II. Additional College of Business and Economics Requirements*

Lower Division Requirements 18-26 credits
Upper Division Requirements 24-25 credits

In order for the applicant to be considered for admission to the junior year curriculum, a student must have substantially completed all general studies and lower division Business and Economics core courses.

Electives to bring the total to a minimum of 120 credits with a minimum of 48 credits outside the College of Business and Economics are required.

No minor is required.

III. Additional College of Letters and Sciences Requirements

Mathematics 760143 or 760152 3-5 credits
Writing Proficiency 3 credits
Accounting Concepts 210244 3 credits
Managerial Accounting 210249 3 credits
Upper Division Business Electives 6 credits
(two chosen from a prescribed list)

A minor in any area other than Computer Science, or the MCS extended major is required.

Electives to bring the total to a minimum of 120 credits are required.

*For a detailed description of these requirements, see the current University of Wisconsin-Whitewater Bulletin.

The MCS Cooperative Studies Program

Students in the MCS major may apply for the MCS Cooperative Studies Program. Those students accepted spend a seven-month period (a semester plus a summer), usually at the end of their junior year, working in the information systems area for a company approved by the faculty.

Student benefits include broadened training and work experience, contacts with prospective employers, academic credit, and the income earned as an employee of the firm. Upon graduation, most Co-op students receive employment offers from their Co-op company.

MCS Minority Scholarship

In conjunction with the Minority Business Program, the MCS major offers a 4-Plus Year MCS Scholarship for Minority Students program to provide financial assistance to academically talented ethnic minority undergraduate students pursuing an MCS degree. The scholarship provides financial support while the student earns an MCS undergraduate degree at UW-Whitewater. The scholarship can be renewed annually provided the student's academic work and credit progress is satisfactory and completed in the MCS program at UW-Whitewater.

For further information and application forms, contact the MCS program or the Minority Business Program at UW-Whitewater.

The MCS Executive Advisory Board

The MCS curriculum was originally developed and continues to be monitored in consultation with many of the leaders in the business data processing community. Twenty-two of these specialists, representing a wide spectrum of industrial firms, serve on the MCS Executive Advisory Board. This Board meets with the faculty semi-annually and is charged with keeping the curriculum viable and up-to-date as well as establishing proper goals and directions for the major.

Computing Equipment at UW-Whitewater

The UW-Whitewater Computer Center supports two large computers devoted exclusively to academic purposes, a DEC VAX 11/780 timesharing system and an IBM 4341. Over 125 student terminals are available in the Computer Center, residence halls and academic buildings providing round the clock access. An IBM 4381 is used for administrative support.

In addition, the campus features three large micro-computer labs: a 35 station networked AT&T/IBM lab, a 35 station Macintosh lab and a 25 station Apple lab.

By fall, 1988, the MCS program will be housed in a new \$4.4 million instructional computing building. This new structure will feature state of the art electronic teaching tools and laboratories. In addition, a recently installed communications system provides access to academic computing resources from anywhere on campus. These two major projects will create a superb computing environment for the pursuit of excellence.

The MCS Faculty

The MCS faculty consists of professionals from the Management Department in the College of Business and Economics and from the Mathematics and Computer Science Department in the College of Letters and Sciences. This diverse faculty provides the inter-college

program with the expertise in computer science, mathematics, business information systems, computer center management and other computer related disciplines necessary to maintain professional standards in the wide variety of courses offered.

Student DPMA Chapter

The student chapter of the Data Processing Management Association promotes interest and an understanding of business data processing through the sponsorship of guest lectures, seminars and field trips to computer installations and DPMA conferences. This group is sponsored by the Milwaukee DPMA chapter and has received numerous awards from its parent organization.

In addition to their educational activities, the chapter maintains close ties with regional employers and engages in consulting work for local firms.

For Further Information Write:

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University of Wisconsin-Whitewater

Whitewater, Wisconsin 53190

Office of the Dean (414) 472-4900

College of Business and Economics, 4035 Carlson

Office of the Dean (414) 472-1620

College of Letters and Sciences, 237 Baker

Chairperson (414) 472-3964

Management Department, 5045 Carlson

Chairperson (414) 472-1313

Mathematics and Computer Science Department,

119 Baker

The current MCS Executive Advisory Board includes representatives from: American Family Insurance, Arthur Andersen & Co., J. I. Case, Deluxe Data Systems, First Wisconsin National Bank of Milwaukee, Fort Howard Paper Co., General Casualty Insurance, Johnson Controls, Inc., M. & I Bank, Oscar Mayer & Co., MGIC, Miller Brewing Co., Northwestern Mutual Life, Outboard Marine Corp., J. C. Penney Co., St. Lukes Samaritan Health Care, Inc., State Farm Insurance, Virchow, Krause & Co., Walgreen Co., Wisconsin Bell, Wisconsin Electric Power Co., and Wisconsin Gas Co.

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